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ABSTRACT

This study investigated the relationship between physical education teachers' attitudes toward physical activity and fitness and what they taught in their classes. Participants were 42 elementary and secondary physical education teachers selected according to high physical activity and fitness attitude or low physical activity and fitness attitude scores on an instrument designed to measure the relative importance of four physical education outcome goals to teachers. Researchers observed each teacher twice using the System for Observing Fitness Instruction Time instrument to measure instructional behaviors related to physical activity and fitness. They coded the data from their observations, then combined participants' observation data and attitude data to determine the relationship between attitudes and actions. Data analysis did not show a significant effect between the two attitude groups. There were no significant differences between the high physical activity and fitness and low physical activity and fitness groups in the percent of class time spent in moderate to vigorous physical activity, fitness activities, or teacher behaviors related to fitness. In all three areas, however, there were trends in the hypothesized direction (that physical educators who highly valued physical activity and fitness would have more moderate to vigorous physical activity in their classrooms, allocate more time to fitness activities, and spend more time promoting fitness). (Author/SM)

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RELATIONSHIP BETWEEN TEACHERS' ATTITUDES AND ACTIONS TOWARD TEACHING PHYSICAL ACTIVITY AND FITNESS

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Abstract

The purpose of this study was to investigate the relationship between teachers' attitudes toward physical activity and fitness and what is taught in their classes. Participants were 42 physical education teachers selected based on high physical activity and fitness or low physical activity and fitness attitude scores on a previously validated instrument designed to measure the relative importance of several physical education outcome goals to teachers. Each teacher was observed twice using an established observation instrument to measure instructional behaviors related to physical activity and fitness. Participants' observational data were combined with their attitude data and the relationship between their attitudes and actions was determined. MANOVA and effect size results did not show a significant effect between the two attitude groups. There were no significant differences between the high physical activity and fitness and low physical activity and fitness attitude groups in the percent of class time spent in moderate to vigorous physical activity, fitness activities, or teacher behaviors related to fitness. In all three areas, however, there were trends in the hypothesized direction.

RELATIONSHIP BETWEEN TEACHERS' ATTITUDES AND ACTIONS TOWARD TEACHING PHYSICAL ACTIVITY AND FITNESS

Teachers develop strong belief systems that may influence their curriculum, teaching and evaluation practices. An individual's beliefs, attitudes, and values compose their belief system (Pajares, 1992). Beliefs are assumptions about the world and oneself held by individuals based on their own experiences or external authorities (Athos & Gabarro, 1978). Attitudes develop when a group of beliefs cluster around a particular situation or object and are prone to action. Finally, when beliefs evaluate or make a judgment in a situation and call for action, values have been developed. There are times when teachers' belief systems are congruent with their teaching practices and there are times when belief systems and practices are incongruent.

The teaching behaviors observed in gymnasiums or classrooms are related to the belief systems of teachers. There is not, however, a simple one-to-one relationship between beliefs and behaviors. For this study, the framework for understanding the relationship between belief systems and teaching behaviors is based primarily on the work of Sigel (1985).

There are a variety of factors that may influence whether beliefs are transformed into actions including: (a) intention, (b) value, and (c) affective disposition or feelings (Sigel, 1985). Individuals must intend to act on beliefs. Intentions are necessary for attitudes to influence behavior. Intentions may change, however, due to expected responses from others. For example, a physical education teacher may believe that fitness activities are an important part of the physical education curriculum. In previous lessons, however, students may have been very resistant to participate in sit-ups, push-ups and running activities. The teacher may begin to avoid including fitness activities in the curriculum due to the anticipated responses from the students.

Related to the intentions of teachers are their values--the importance of the intended action to teachers' goals. Teachers appear to act upon beliefs that they highly value and that are important to their teaching goals, even when it requires overcoming obstacles. If beliefs are of a lesser value to teachers and tangential to their goals, barriers can deter them from acting on their beliefs (Ennis, Ross, & Chen, 1992; Nespor, 1987).

How teachers feel about the action also plays a role in the transformation of belief systems into actions. Teaching and content decisions are influenced by teachers' value orientations or the relative importance of several key factors in the teacher-learning process to teachers (Ennis, 1994). Teaching decisions also are influenced by teachers' attitudes toward the curriculum--including goals and priorities. Teachers also have attitudes about their own abilities to teach specific content. Their self-efficacy may influence their ability to teach certain content, work with specific types of students, or use various teaching

strategies in classes (Ennis, 1996). In addition, teachers have attitudes regarding students, including specific expectations, (Martinek, 1989) that can influence the teaching-learning process.

Another factor in the relationship between teachers' belief systems and actions is the context. The context is fundamentally important to understanding teachers' beliefs and any attempt to connect beliefs to action (Nespor, 1985). The instructional context is richly layered and includes characteristics of communities, schools, classrooms, students and their families (Ennis, 1996). All of these factors can influence the ability of teachers to teach in a manner that is consistent with their belief systems (Parker, 1996).

Many studies in education (DeFord, 1985; Richardson, Anders, Tidwell, & Lloyd, 1991) and physical education (Rauschenbach, 1992) have shown a relationship between belief systems and actions. Other studies in education (Duffy, 1981; Hoffman & Kugle, 1982) and physical education (Roberts, 1990; Romar, Akademi, & Siedentop, 1995) have not shown belief systems to be reflected in teaching practices or have shown belief systems to be only partially reflected in teaching practices (Hook & Rosenshine, 1979; Siedentop, Doutis, Tsangaridou, Ward, & Rauschenbach, 1994).

The discrepancies in the data may be partially attributed to contextual differences. Studies in education (Raymond, 1994) and physical education (Wang, 1977; Templin, 1979) have shown students to be an influential factor on teachers' instructional practices. Studies investigating the relationship between teachers' belief systems and actions have shown conflicting results, yet many show a relationship between educational priorities and teaching behaviors.

Teachers' belief systems may play an important role in the selection of content and instructional behaviors. Physical education specialists often are responsible for making curricular decisions for their programs. Although the formal content for physical education often is present in curricular guidelines, a large number of activities generally are listed without specific priorities for the curriculum (Steinhardt, 1992).

Teachers' curricular and instructional decisions influence the physical activity opportunities of their students. The important role that physical education plays in the physical activity participation and health of our children and youth is well established and emphasized in the Surgeon General's report on Physical Activity and Health (U.S. Department of Health and Human Services [USDHHS], 1996). Schools and physical education programs are the only organizations capable of addressing the physical activity needs of the majority of the children and youth in our nation (Sallis & McKenzie, 1991). Most states have mandatory physical education (NASPE, 1997) and students attend school for many years (USDHHS, 1997). Youth participation in physical activities outside the school environment can be limited due to a variety of

factors, including urbanization, fiscal restraints, and a lack of available programming (McKenzie et al., 1995). Although the tremendous health benefits of regular physical activity leading to the development of fitness are well established, very little is known about physical education teachers' attitudes toward teaching physical activity and fitness and the relationship between attitudes in this area and teaching behaviors.

In an earlier study, physical educators (N=253) indicated that physical activity and fitness was the most important outcome goal for physical education followed by self-actualization, motor skill development, and social development, respectively (Kulinna & Silverman, 1997a). The purpose of this study was to investigate the relationship between teachers' attitudes toward physical activity and fitness and what is taught in their classes.

Method

Teachers were selected for this study based on the importance of various outcome goals for physical education. Physical education classes were observed using an established observation instrument. Observational data were combined with attitude data on the participants and multivariate statistical procedures were used to determine the congruency of teachers' attitudes and actions.

Selection of Teachers

Data on the relative importance of four physical education outcome goals to teachers were used from a previous study on teachers' attitudes. Participants for the attitude study were 253 elementary, middle school/junior high, and high school teachers from 18 states with 1-40 years of teaching experience. The study on teachers' attitudes used a previously validated instrument that had demonstrated the psychometric properties of reliability and validity in the population in which it was used (Kulinna & Silverman, 1997b). Copies of the attitude instrument may be obtained by contacting the lead author.

Data from the study on teachers' attitudes were scored by creating measures for each of the four outcome goals for physical education or domains of the instrument. Possible scores for each domain area ranged from 9 to 45 with lower scores indicating higher attitudes. Data analyses were performed on the physical activity and fitness domain area data to select cut points for physical educators with high physical activity and fitness attitudes and low physical activity and fitness attitudes for class observations. Scores above the 75th percentile (score of 12 and below) and below the 25th percentile (score of 18 and above) on the physical activity and fitness measure were selected.

Participants from two states, Illinois and Indiana, (n=105) were rank ordered according to their physical activity and fitness scores. The cutoff scores based on the entire sample were then applied to participants in this group. Potential participants in the high physical activity and fitness attitude group and low physical activity and fitness attitude group were 26 and 24, respectively. The teachers identified as high and low in their physical activity and fitness attitudes were asked to participate in the class observations.

Recruitment of Teachers

Participants in the attitude study from three states (i.e., Illinois, Indiana, Oregon) initially agreed to participate in a series of studies including this study of the relationship between teachers' attitudes and actions. They also were informed, however, of their right to discontinue participation in the series of studies at any time. They completed an informed consent form, a demographic information form and the attitude instrument. Participants in Illinois and Indiana were selected to participate in this study (due to their proximity to the researcher). Physical educators were contacted by phone or in person and asked to allow the researcher to observe two physical education classes. They were told that the researcher would be quantifying the class activities and teaching behaviors. The times and dates for the observations were scheduled with the participating teachers.

Participants

Forty-two currently employed physical education teachers were the participants for this study. Both genders were well represented with 23 females (55%) and 19 males (45%) in the sample. Similarly, there was significant representation from all three teaching levels, elementary (n=18), middle school/junior high (n=11), and high school (n=13) teachers. The majority of the participants were Caucasian (95.2%), with two African-American participants (4.8%). Participants were primarily from Illinois, with one participant from Indiana. A frequency table of participants for this study by group, gender and teaching level is available in Table 1.

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insert Table 1 about here

Four selected teachers who did not participate in this study offered the following reasons: (a) promotion to assistant principal, (b) retirement, (c) cessation of position at the school, and (d) an injury. The remaining potential participants (i.e., 4 teachers) were not asked to participate in an effort to maintain an equal number of participants in the two groups.

Both the high physical activity and fitness and low physical activity and fitness attitude groups were comprised of 21 participants. The use of at least 10 participants per group is considered the minimum for observational research and is often practically what can be performed (Good, 1970). Typically, studies of this kind employ fewer than 10 total teachers. The use of 21 participants in each attitude group gives this study much greater statistical power.

Observations

The System for Observing Fitness Instruction Time (SOFIT) instrument was used for the class observations in this study. It is a momentary time sampling and interval recording (every 20 seconds) system designed to track physical activity levels and opportunities for youth to become fit in physical education (McKenzie, Sallis, & Nader, 1991). The reliability, validity and feasibility of the SOFIT instrument have been demonstrated through several studies involving a variety of methods (McKenzie et al., 1991; McKenzie, et al., 1994; Rowe, Schuldheisz, & van der Mars, 1997). The SOFIT instrument was selected for this study due to its inclusion of the factors of curricular context and teacher behavior as well as factors associated with health related fitness.

A total of 84 classes were observed using the SOFIT instrument. Each participant was observed two times with the observations occurring on different days. The content, grade level, and specific classes to be observed were not controlled by the researcher. These factors were not controlled in order to provide a representative sample of teachers' fitness related behaviors. The observers included the researcher and a second coder who participated in the reliability testing.

Data were collected using the SOFIT instrument. During coding, the categories of student activity (i.e., lying down, sitting, standing, walking), lesson context (i.e., management, general knowledge, physical fitness knowledge, fitness activity, skill drills and scrimmages, game play, other) and teacher behavior (i.e., promotes fitness, demonstrates fitness, instructs generally, manages, observers, other-task) are simultaneously coded. A beeper board designed expressly for this study (accurate to 100th of a second) was used providing auditory and visual stimuli for the 10 second observe and 10 second record intervals of the SOFIT instrument. Observations were conducted by randomly selecting students as they entered the gymnasium and rotating the focus among four target students every four minutes. The guidelines for observer training and data collection using the SOFIT instrument were based on the technical descriptions and directions for observers provided by McKenzie (1995).

Observer training included the simultaneous coding of approximately 80 classes, a combination of videotaped sessions and live observations, approximately 100 hours spread over a two month period. Data collection did not begin until there was greater than a .90 inter-observer agreement (IOA) achieved for three consecutive classes between the researcher and the second coder.

For reliability checks, a single beeper box was used to pace both observers using a y-adapter and attaching two ear jacks. The two coders simultaneously observed 14 (16.7%) of the physical education classes for reliability testing. The second coder participated in approximately every 8th observation. Inter-observer agreements were calculated overall and by categories of the SOFIT instrument (student activity, lesson context, teacher behavior) using the standard formula [(agreements/observed intervals) * 100]. The data collected by the researcher during reliability testing was used for the study.

Data Analysis

Descriptive analysis and percent occurrence of intervals were calculated for each SOFIT subcategory for the two classes. Several new categories were created including: (a) an activity category (MVPA) by summing the walking and very active categories; (b) a lesson context category (fitness and fitness knowledge) by summing the fitness and physical fitness knowledge categories; and (c) a teacher behavior category (teacher fitness behaviors) by adding together the promotes fitness and demonstrates fitness categories. The range of values and means also were calculated for the frequency and duration of physical education classes. In addition, the content was analyzed by frequency of physical activities.

Effect sizes were calculated between the high physical activity and fitness attitude group and the low physical activity and fitness attitude group to test the study's three hypotheses, namely, that physical educators who highly value physical activity and fitness will have more moderate to vigorous physical activity (MVPA) in their classes, will allocate more time to fitness activities, and will spend more time promoting fitness. The variance-accounted-for effect sizes (Educational and Psychological Measurement, 1997), were calculated using the following formula: the high physical activity and fitness attitude group mean minus the low physical activity and fitness attitude group mean, divided by the low physical activity and fitness attitude group standard deviation. This standard deviation (SD) was used due to the similarity to using a control group (i.e., less variance). The difference between the high and low attitude group variances on the three measures were then tested using F tests.

Multivariate analysis of variance (MANOVA) also was used to test the hypotheses. A two-way MANOVA was performed by attitude group (high or low physical activity and fitness attitude) and teaching level (elementary school, middle/junior high school, high school) with percent time in MVPA, percent time in fitness activities, and percent time in teacher behaviors related to fitness as the dependent variables.

Results

A high level of inter-observer agreement was maintained throughout data collection. The overall inter-observer agreement for this study was 94.8%, with classes ranging from 92.2% to 97.2%. High levels of inter-observer agreement also were maintained for each major category on the SOFIT instrument (student activity 92.9%, lesson context 96.4%, teacher behavior 95%).

Demographic data showed a range of 20-80 minutes ($\underline{m}$ = 39.19) and 2-5 days per week ($\underline{m}$ = 4.17) assigned to physical education classes. Activities taught during physical education varied a great deal both between and within participants, with 29 different activities observed. Please refer to Table 2 for the frequencies of physical activities observed.

Insert Table 2 about here

Forty-five percent of class time over the 84 class sessions was spent in MVPA. The remaining fifty-five percent of class time was spent in non-MVPA (i.e., students lying down, sitting, or standing). The lesson context for physical education classes was designated motor behavior over half of the class time (62.5%), including fitness (16%), skill practice (21.1%), game play (24.1%), and free play activities (1.3%). Knowledge comprised 16.6% of class time (general knowledge 16.1%, physical fitness knowledge 0.5%). In addition, a large proportion of class time was spent in management activities (20.8%).

Teachers spent the majority of physical education class time in general instruction (65.3%). The other two prominent teacher behaviors observed during physical education classes were manages (22.2%) and observes (10.0%). Very few teacher behaviors were observed in demonstrating or promoting fitness (2.2%). The means and standard deviations for percent occurrence of intervals for all SOFIT categories for the 84 classes (overall) and for high and low physical activity and fitness attitude groups are presented in Table 3.

Insert Table 3 about here

The attitude data and the SOFIT observation data were combined into one data set in order to conduct analyses comparing participants attitudes with their teaching behaviors. The effect sizes were .43, .32 and .25, for the time in MVPA, time in fitness activities and time in teacher behavior related to fitness, respectively. There was less than a half of a SD difference between the two groups for any of the variables.

The MANOVA indicated that there was not a difference on any of the three variables between the attitude groups (Wilks' Lambda = 0.96, $F(3, 34) = .53$, $p = 0.66$). There also was no difference by level of teaching (Wilks' Lambda = 0.75, $F(6, 68) = 1.77$, $p = 0.12$) or interaction effects (Wilks' Lambda = 0.84, $F(6, 68) = 1.00$, $p = 0.43$).

Although significant effects were not found between the high and low physical activity and fitness attitude groups, there were trends in the hypothesized direction (see Table 3). Classes taught by teachers in the high physical activity and fitness attitude group showed a trend toward spending more time in all of the fitness related categories including, time in MVPA, time in fitness activities, and time in teacher behaviors related to fitness. Although differences between the attitude groups were not significant, it is interesting to note that the high physical activity and fitness attitude group spent less time in non-MVPA (52.17%) than the low attitude teachers (58.05%). The high physical activity and fitness attitude teachers also had more physical education classes per week ($m=4.45$) and more minutes assigned per class session ($m=45.10$) than the low physical activity and fitness attitude teachers (means for classes per week and minutes assigned per class session, were $m=3.99$ and $m=33.29$, respectively).

Discussion

Demographic data results showed a large range of allocated class time and number of classes per week for physical education. High physical activity and fitness attitude teachers had more time in physical education classes each week. Having more class time may affect teachers' outcome goals. Teachers with more class time may believe time can be allocated in physical education to fitness activities (e.g., circuit activities, stretching, cardiovascular warm-ups and cool-downs) and there will still be adequate class time to devote to other outcome priorities, such as motor skill development.

During the 84 class observations, 29 different physical activities were observed. Volleyball was the most commonly observed activity, with over three times the frequency of all other activities. This may be attributed to the time of year the observations were performed (January to April). Jump rope activities were observed four times and were related to the Jump Rope for Heart Program conducted by the American Heart Association and the American Alliance of

Health, Physical Education, Recreation, and Dance. There were low and high physical activity and fitness attitude teachers observed implementing this program. Low physical activity and fitness attitude teachers may have had more time in MVPA and fitness activities during this unit than at other times during the year.

Although 50% of the teachers placed physical activity and fitness as their highest priority, only 15% of the observed classes included fitness activities (as categorized by the SOFIT instrument) as the primary focus. Through class observations and informal discussions with physical education teachers, it appeared that a lack of content knowledge related to fitness activities and how to implement these activities into physical education classes, was a limiting factor for the teachers.

There were encouraging findings related to physical activity and fitness in the amount of MVPA observed in the participants' classes. An average of 45% of class time was spent in MVPA over the 84 classes. This is an improvement over the dismal findings of only 7 to 8.5% of the class time spent in MVPA reported in several research studies (Parcel et al., 1987; Simons-Morton, Taylor, Snider, & Huang, 1993), and surpasses the baseline level of 37% of class time spent in MVPA obtained during "The Child and Adolescent Trial for Cardiovascular Health" (CATCH) intervention study (McKenzie et al., 1996). The time spent in MVPA during these observations, however, did not meet the goal of 50% of class time spent in MVPA by the year 2000 (USDHHS, 1980, 1991). To date, only intervention programs, the Sports, Play, and Active Recreation for Kids (SPARK) and the CATCH program have met this goal (McKenzie et al., 1996; McKenzie, Sallis, Kolody, & Faucette, 1997). Studies on time in physical education have shown that the time students spend in practice is related to achievement and that not all types of practice are equal (Silverman, 1988). Time spent in individual student practice is the most significant factor in learning motor skills (Silverman, 1996). Time and practice are important for learning motor skills and for the development and promotion of physical activity.

Although 45% of the class time in this study was spent in MVPA, it is discouraging to note that 55% of the class time was spent in non-MVPA, including the behaviors of lying, sitting, and standing. Continued improvements are needed in the amount of physical education class time spent in MVPA. While not all class time can be spent in MVPA, a significant proportion can be spent with students physically active. Certain aspects of teaching, such as knowledge and transitions, also are a part of physical education and must occur. Teachers can, however, incorporate these into lesson plans and still have high levels of MVPA.

Related to the goal of spending 50% of class time in MVPA, is the goal of increasing student participation during class time when the lesson context is physical activity. In the current study, 62% of the class time was designated for physical activity or time when the lesson context was fitness, skill development,

game play, or free play. Students, however, were only participating in MVPA 45% of the class time. Greater than 17% of the designated activity time was spent with students lying, sitting or standing.

The most prevalent teacher behavior observed was instructs generally. This finding also is encouraging relative to the future of physical education. Teachers spent the majority of their time in behaviors related to instruction (65%). The minimal teacher behavior observed related to demonstrating or promoting fitness, however, is cause for concern (less than 2% of class time). Teachers rarely exhibited role model behaviors of an active lifestyle. Furthermore, only one instance was observed of a physical educator encouraging students to participate in physical activities outside physical education over the course of 84 class observations. Training teachers to exhibit an active lifestyle as well as to encourage and support participation in various physical activities, may lead to a more active lifestyle for youth. A successful model for this type of training has been shown in the CATCH intervention study (McKenzie et al., 1996).

While a teacher may have a high physical activity and fitness attitude, a variety of factors may interfere with their ability to act in accordance with their attitude, including the characteristics of the context, intention to act, the importance of the action to goals, and feelings about the action. In this study, the ability of high physical activity and fitness attitude teachers to include physical activity and fitness in their classes may have been limited by the following factors: (a) the size of the classes, (b) characteristics of the students, and (c) the teachers' knowledge, belief systems, and self-efficacy toward teaching physical activity and fitness.

Specific factors within the gymnasium or activity space can influence teaching behaviors, such as the size of the teaching facility, the number of students, and the available equipment. In this study, class size appeared to affect teachers' ability to provide students with large amounts of MVPA and to include fitness activities in their classes. Two teachers--one at the high school level and one at the middle school level--noted that their class sizes were greater than 80 students. A common strategy used by teachers in this study to compensate for oversized classes was to break the class into groups and allow only one group to participate at a time. This greatly reduced the opportunities for students to participate in MVPA. Moreover, in some cases, groups of students did not have an opportunity to participate at any time during the class. As has been noted in the classroom (Cahen, Filby, McCutcheon, & Kyle, 1983) and in the teaching of motor skill in physical education (Silverman, 1988), class size often is related to pedagogical activities.

It is possible that teachers in this study also were influenced by the students in their classes. Teachers' intentions to include large amounts of MVPA as well as fitness activities may have been negotiated, in some cases, with

students in an effort to manage the classes.

The knowledge, belief systems, and self-efficacy of teachers related to teaching physical activity and fitness also may have influenced teachers' behaviors. From observation and informal discussion, it appeared that the teachers had a limited knowledge base related to fitness activities and how to incorporate these activities into their classes. They also may have had low levels of self-efficacy toward teaching fitness activities. Traditional (adult style) calisthenic movements, such as running, sit-ups and push-ups, were commonly observed in physical education classes. Student attitudes toward these traditional activities often are not favorable and minimal effort may be expended to perform the activities. A negotiation progress may take place between the physical education teacher and the students regarding traditional calisthenics activities. One study reported a teacher and her students were happier after moving toward a recreational focus in exchange for student compliance and motivation (O'Sullivan, Siedentop, & Tannehill, 1994).

The knowledge base of teachers related to physical activity and fitness also may influence how they define fitness. For some of the physical educators in this study, fitness appeared to be synonymous with fitness testing. Fitness testing activities, in some cases, comprised the entire fitness unit. Fitness tests have been identified as the most common form of assessment used in physical education (Hopple & Graham, 1995).

One methodological issue that may have influenced the results of this study is that the content was not controlled. The content for the observations was not controlled in this study in order to obtain a representative sample of teaching behaviors. If the content for the study was controlled, different teaching behaviors may have been observed. Controlling the content, however, would have resulted in greater difficulty in obtaining teachers who wanted to participate, and in implementing the study (Silverman, 1985).

In this study, it was shown that there was not a direct relationship between teachers' attitudes and their teaching behaviors. Although significant differnces were not found, there were tendencies for the high physical activity and fitness attitude teachers to provide slightly more opportunities for MVPA, fitness activities, and to exhibit more teacher behaviors related to promoting and demonstrating fitness. Teachers may have high physical activity and fitness attitudes and not be able to act in a manner that is consistent with their belief systems. The context may limit teachers' ability to teach consistently with their belief systems as well as their knowledge, skills, and the available resources to make physical activity and fitness a priority in physical education.

References

Athos, A. G. , & Gabarro, J. J. (1978). The individual frame of reference. In A.G. Athos & J.J. Gabarro (Eds.), Interpersonal behavior: Communications and understanding in relationships (pp. 137-148). Englewood Cliffs, NJ: Prentice Hall.

Cahen, L. S., Filby, N., McCutcheon, G., & Kyle, D. W. (1983). Class size and instruction. New York: Longman.

DeFord, D. (1985). Validating the construct of theoretical orientation in reading instruction. Reading Research Quarterly, 20, 351-367.

Duffy, G. (1981). Theory to practice: How does it work in real classrooms? (Research series #98). East Lansing, MI: Institute for Research on Teaching, College of Education.

Educational and Psychological Measurement (1997). Computing Effect Sizes, on the world wide web. URL: http://ACS.TAMU.EDU/~bbt6147/effect.html

Ennis, C. D. (1994). Urban secondary teachers' value orientations: Social goals for teaching. Teaching and Teacher Education, 10, 109-120.

Ennis, C. D. (1996). A model describing the influence of values and context on student learning. In S. J. Silverman & C. D. Ennis (Eds.), Student learning in physical education: Applying research to enhance instruction (pp. 127-147). Champaign, IL: Human Kinetics.

Ennis, C. D., Ross, J. & Chen, A. (1992). The role of value orientations in curricular decision making: A rationale for teachers' goals and expectations. Research Quarterly for Exercise and Sport, 63, 38-47.

Good, T. L. (1970). Which pupils do teachers call on? Elementary School Journal, 70, 190-198.

Hoffman, J. V., & Kugle, C. (1982). A study of theoretical orientations to reading and its relationship to teacher verbal feedback during reading instruction. Journal of Classroom Interaction, 18, 2-7.

Hook, C. M., & Rosenshine, B. V. (1979). Accuracy of teacher reports of their classroom behavior. Review of Educational Research, 49, 1-12.

Hopple, C., & Graham, G. (1995). What children think, feel, and know about physical fitness testing. Journal of Teaching in Physical Education, 14, 408-417.

Kulinna, P., & Silverman, S. (1997a). Teachers' Attitudes Toward Physical Activity and Fitness. Research Quarterly for Exercise and Sport, 68, A-82.

Kulinna, P., & Silverman, S. (1997b). Development of an instrument to measure teachers' attitudes toward physical activity and fitness. In S. Stroot (Ed.), Special Interest Group: Research on Teaching and Learning in Physical Education 1997 Conference Proceedings--American Educational Research Association. Columbus, OH: The Ohio State University.

Martinek, T. J. (1989). Children's perceptions of teaching behaviors: An attributional model for explaining teacher expectancy effects. Journal of Teaching in Physical Education, 8, 318-328.

McKenzie, T. L. (1995). System for Observing Fitness Time. Unpublished paper, San Diego State University.

McKenzie, T. L., Feldman, H. Woods, S. E., Romero, K. A., Dahlstrom, V., Stone, E. J., Stikmiller, P. K., Williston, J. M., & Harsha, D. W. (1995). Children's activity levels and lesson context during third-grade physical education. Research Quarterly for Exercise and Sport, 66, 184-193.

McKenzie, T. L., Nader, P. R., Strikmiller, P. K., Yang, M., Stone, E. J., Taylor, W. C., Perry, C. L., Epping, J., Feldman, H., Luepker, R. V., & Kelder, S. H. (1996). School physical education: Effect of the Child and Adolescent Trial for Cardiovascular Health (CATCH). Preventive Medicine, 25, 423-431.

McKenzie, T. L., Sallis, J. F., Kolody, B. & Faucette, N. (1997). Long-term effects of a physical education curriculum and staff development program: SPARK. Research Quarterly for Exercise and Sport, 68, 280-291.

McKenzie, T. L., Sallis, J. F., & Nader, P. R. (1991). SOFIT: system for observing fitness instruction time. Journal of Teaching in Physical Education, 11, 195-205.

McKenzie, T. L., Strikmiller, P. K., Stone, E. J., Woods, S. E., Ehlinger, S., & Romero, K. A., & Budman, S. T. (1994). CATCH: physical activity process evaluation in a multicenter trial. Health Education Quarterly, 21, S73-S89.

National Association for Sport and Physical Education. (1997). Shape of the nation 1997: A survey of state physical education requirements. Reston, VA: American Alliance for Health, Physical Education, Recreation and Dance.

Nespor, J. (1985). The teacher beliefs study: An interim report. (R & D Report N. 8020). Texas: The University of Texas at Austin, Research and

Development Center for Teacher Education. (ERIC Document Reproduction Service No. ED 251 432)

Nespor, J. (1987). The role of beliefs in the practice of teaching. Journal of Curriculum Studies, 19, 317-328.

O'Sullivan, M., Siedentop, D., & Tannehill, D. (1994). Breaking out: Codependency of high school physical education. Journal of Teaching in Physical Education, 13, 420-441.

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. Review of Educational Research, 62, 307-332.

Parcel, G. S., Simons-Morton, B. G., O'Hara, N. M., Baranowski, T., Kolbe, L. J., & Bee, D. E. (1987). School promotion of healthful diet and exercise behavior: An integration of organizational change and social learning theory interventions. Journal of School Health, 57, 150-156.

Parker, F. J. (1996). Teacher and student beliefs: A case study of a high school physical education class. Dissertation Abstracts International, 57 (10), 4305A. (University Microfilms No. AAG9709640)

Rauschenbach, J. W. (1992). Case studies of effective physical education specialists: Relationships among curricular values, teaching strategies, and student involvement. Dissertation Abstracts International, 53 (11), 3842A. (University Microfilms No. AAG9238260)

Raymond, A. M. (1994). Understanding relationships between beginning elementary teachers' mathematics beliefs and teaching practices. Dissertation Abstracts International, 54 (09), 3314A. (University Microfilms No. AAG9404352)

Richardson, V., Anders, P., Tidwell, D., & Lloyd, C. (1991). The relationship between teachers' beliefs and practices in reading comprehension instruction. American Educational Research Journal, 28, 559-586.

Roberts, E. (1990). Teachers' beliefs about purposes as reflected in teaching practices: A study in elementary school physical education. Dissertation Abstracts International, 52 (02), 467A. (University Microfilms No. DA9121491)

Romar, J., Akademi, A., & Siedentop, D. (1995). A multiple case study of Finnish physical educators: Espoused and enacted theories of action, Research Quarterly for Exercise and Sport, 66, (Suppl.), A-68.

Rowe, P., Schuldheisz, J., & van der Mars, H. (1997). Measuring physical activity in physical education: Validation of SOFIT for use with first to eight grade students. In S. Stroot (Ed.), Special Interest Group: Research on Teaching and Learning in Physical Education 1997 Conference Proceedings--American Educational Research Association. Columbus, OH: The Ohio State University.

Sallis, J., & McKenzie, T. (1991). Physical education's role in public health. Research Quarterly for Exercise and Sport, 62, 124-137.

Siedentop, D., Doutis, P., Tsangaridou, N., Ward, P. & Rauschenbach, J. (1994). Don't sweat gym! An analysis of curriculum and instruction. Journal of Teaching in Physical Education, 13, 375-394.

Sigel, I. E. (1985). A conceptual analysis of beliefs. In I. E. Sigel (Ed.), Parental belief systems: The psychological consequences for children (pp. 345-371). Hillsdale, NJ: Laurence Erlbaum Associates.

Silverman, S. (1985). Critical considerations in the design and analysis of teacher effectiveness research in physical education. International Journal of Physical Education, 22(4), 17-24.

Silverman, S. (1988). Relationships of selected presage and context variables to achievement. Research Quarterly for Exercise and Sport, 59, 35-41.

Silverman, S. (1996). A pedagogical model of human performance determinants in sports. Proceedings of the pre-congress symposium of the 1996 Seoul international Sport Science Congress. Seoul, Korea: Korean Alliance for Health Physical Education, Recreation, and Dance.

Simons-Morton, B. G., Taylor, W. C., Snider, S. A., & Huang, I. W. (1993) The physical activity of fifth-grade students during physical education classes. American Journal of Public Health, 83, 262-264.

Steinhardt, M. A. (1992). Physical education. In P. W. Jackson (Ed.), Handbook of Research on Curriculum (pp. 964-1001). New York: Macmillan.

Templin, T. J. (1979). Student as socializing agent. Journal of Teaching in Physical Education, introductory issue, 71-79.

U.S. Department of Health and Human Services. (1980) Promoting health/preventing disease: Objectives for the nation. Washington, DC: Government Printing Office.

U.S. Department of Health and Human Services. (1991) Healthy People 2000: National health promotion and disease prevention objectives. Washington, DC: U.S. Department of Health and Human Services, Public Health Service. DHHS Publication No. (PHS)91-50212.

U.S. Department of Health and Human Services. (1996) Physical activity and health: A report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

U.S. Department of Health and Human Services. (1997) Promoting Lifelong Physical Activity, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

Wang, B. M. (1977). An ethnography of a physical education class: An experiment in integrated living. Dissertation Abstracts International 38 (04), 1980A. (University Microfilms No. AAG7721750)

Table 1

Frequency of Participants by Group, Gender, and Level

	High Physical Activity and Fitness		Low Physical Activity and Fitness		
Level of Teaching	Male	Female	Male	Female	Total
Elementary School	1	4	5	8	18
Middle School or Junior High	3	3	2	3	11
High School	5	5	3	0	13
Total	9	12	10	11	42

Note. n=42.

Table 2

Frequency and Percent of Observed Class Activities

Activity	Frequency	Percent	Activity	Frequency	Percent
Badminton	3	3.57%	Pickleball	4	4.76%
Ball Skills	2	2.38%	Relay Run	1	1.19%
Baseball	1	1.19%	Roller Skating	2	2.38%
Basketball	5	5.95%	Rope Climbing	1	1.19%
Bowling	2	2.38%	Scooter Basketball	1	1.19%
Dance	1	1.19%	Soccer	5	5.95%
Deck Tennis	1	1.19%	Swimming Skills	2	2.38%
Dodge ball	2	2.38%	Table Tennis	1	1.19%
Circuit training	2	2.38%	Tennis	3	3.57%
Jump Rope	4	4.76%	Track & Field	3	3.57%
Fitness Running	4	4.76%	Tumbling	5	5.95%
Fitness Testing	3	3.57%	Ultimate Frisbee	1	1.19%
Flickerball	2	2.38%	Volleyball	12	14.29%
Floor Hockey	6	7.14%	Water Safety	2	2.38%
Games	3	3.57%			

Table 3

Means and Standard Deviations for Percent Occurrence of Intervals for SOFIT Categories

Category	Low Activity/Fitness Mean (SD)	High Activity/Fitness Mean (SD)	Overall Mean (SD)
Student Activity			
Lying Down	01.14% (01.89)	00.56% (01.23)	00.85% (01.61)
Sitting	26.95% (14.47)	18.50% (12.21)	22.73% (13.90)
Standing	29.96% (14.36)	33.11% (14.34)	31.53% (14.26)
Walking	32.33% (13.72)	37.08% (13.99)	34.71% (13.90)
Very Active	09.38% (06.10)	10.72% (07.85)	10.05% (06.98)
MVPA	41.72% (14.15)	47.81% (14.64)	44.76% (14.55)
Lesson Context			
Management	23.26% (11.04)	18.35% (05.81)	20.81% (09.06)
General Knowledge	19.61% (13.84)	12.63% (08.74)	16.12% (11.96)
Physical Fitness Knowledge	00.47% (01.80)	00.57% (01.35)	00.52% (01.57)
Fitness	13.51% (15.58)	18.51% (21.61)	16.01% (18.78)
Fitness & Fitness Knowledge	13.99% (15.87)	19.08% (21.88)	16.53% (19.05)
Skill Practice	25.05% (19.15)	17.12% (19.74)	21.09% (19.63)
Game Play	17.46% (31.08)	30.70% (28.57)	24.08% (30.24)
Free Play	00.40% (01.82)	02.11% (06.82)	01.25% (05.01)

Teacher Behavior			
Promotes Fitness	00.68% (01.52)	00.36% (00.86)	00.52% (01.23)
Demonstrates Fitness	01.12% (02.09)	02.18% (04.21)	01.65% (03.32)
Teacher Fitness Behaviors	01.80% (03.03)	02.55% (04.10)	02.17% (03.58)
Instructs Generally	65.77% (17.28)	64.75% (19.39)	65.26% (18.15)
Manages	24.19% (11.60)	20.28% (10.77)	22.23% (11.23)
Observes	07.59% (09.92)	12.30% (14.43)	09.95% (12.46)
Off-Task	00.41% (01.31)	00.11% (00.51)	00.26% (00.99)

Note: n=42 classes for high and low physical activity fitness attitude groups and N=84 for the entire sample. The new variables of MVPA, fitness and fitness knowledge, and teacher fitness behaviors are included. They account for category percentages greater than 100%.